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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,495	10/24/2003	Abhijeet Gole	5693P029	1876

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EXAMINER
VO, THANH DUC

ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/692,495	GOLE ET AL.
	Examiner	Art Unit	
	Thanh D. Vo	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>01 September 2006</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1,3,4,6-10,12,14-17,19 and 20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1,3,4,6-10,12,14-17,19 and 20* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>9/01/2006</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This Office Action is responsive to the Amendment filed on August 28, 2006.

Claims 1, 3, 4, 6, 10, 14 and 15 have been amended. Claims 1, 3, 4, 6-10, 12, 14-17,

19, and 20 are presented for examination. Claims 1, 3, 4, 6-10, 12, 14-17, 19, and 20

are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1, 3, 4, 6-10, 12, 14-16 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Yanai et al. (US Patent 6,502,205) in view of Courts et al. (US Patent

5,636,360)

As per claims 1 and 10, Yanai et al. discloses a method for mirroring data

comprising:

receiving at a first storage server (Fig. 1, item 14) a data access request from a

client (Fig. 1, item 12) coupled to the first storage server 14 (See col. 2, line 60 - col. 3,

line 9);

writing the data access request to a first portion of a non-volatile storage device

(Fig. 1, item 20) in the first storage server (col. 32, lines 55-56);

transmitting the data access request from the first storage server 14 to a second

storage server (Fig. 1, item 46) to be written to a mass storage device (Fig. 1, item 48)

on the second storage server (See col. 10, lines 51-55);

Yanai et al. further teaches cache 28 (Fig. 1) on the primary storage system and

cache 65 (Fig. 1) on secondary storage system to temporary storing the data access

request. See col. 7, line 67 – col. 8, line 2.

Yanai et al. did not explicitly disclose when the first portion of the non-volatile

storage device in the first storage server is full, causing the second storage server to

transfer the data access request from the memory on the second storage server to a

data container corresponding to the first storage server on the second storage server.

Courts et al. teaches a method of copying the contents of a log buffer to a log

partition when the log buffer is full (col. 2, lines 35-37).

It would have been obvious to one having an ordinary skill in the art at the time of

the Applicant's invention to realize that the cache or log buffer in the primary storage

system and the secondary storage system are carrying a ripple effect. Such ripple

effect in the storage system is that once the cache/buffer in the primary storage system

is full, the data then transferred to another storage device within the primary storage

system. The data in the primary storage device and the secondary storage device has

to be mirrored with each other therefore the data has to be transferred to the secondary

storage system as being taught above. Once the cache/buffer in the secondary storage

system is full during the period of receiving the data access request from the primary

storage system, the cache/buffer has to transfer the data to another storage device within the secondary storage system.

Therefore, with the ripple effect relationship set forth, it would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to modify the system of Yanai et al. to implement the method taught by Courts et al. in order to arrive at the current invention in order to enhance the operation speed of the file system while ensuring the consistency and data integrity of the file system as taught by Court et al. on col. 2, lines 41-45.

As per claim 3, Yanai et al. discloses a method wherein causing the second storage server to transfer the data access request from the mass storage device to the data container comprises:

sending a synchronization request at the second storage server from the first storage server. See col. 10, lines 19-23

As per claim 4, Yanai et al. discloses a method comprising:

sending an acknowledgement from the second storage server to the first storage server in response to receiving the data access request (col. 10, lines 19-24) to cause the first storage server to send a response to the client (col. 32, lines 26-27) after the data access request has been stored on the first storage server and stored in the mass storage device on the second storage server. See col. 32, lines 49-57 and col. 2, lines 60-67.

As per claim 6, Yanai et al. discloses a method comprising:

writing the data access request to a first portion of the mass storage device on

the first second storage server, the first portion of the mass storage device on the

second storage server being associated with the first portion of the non-volatile storage

device in the first storage server. *See col. 15, lines 7-14, wherein the R1 and R2 of the*

primary storage system are synchronized and forming a pair with the R1 and R2 of the

secondary storage device. Therefore, the data within R1 of the primary storage device

is duplicate of the data in R1 of the secondary storage device and they are associating

with each other.

As per claim 7, Yanai et al. discloses a method wherein the data access request

is transmitted from the first storage server to the second storage server over a network.

(Fig. 12, items 240-241 and col. 12, lines 40-42)

As per claim 8, Yanai et al. discloses a method comprising:

assigning a sequence number to the data access request, wherein the sequence

number designates a position of the data access request in a group of data access

requests to ensure that the data access request is properly ordered within the data

container. See col. 18 lines 45-54.

As per claim 9, Yanai et al. discloses a method wherein the data container 294

must contain a file. See Fig. 12, item 294.

As per claim 12, Yanai et al. discloses an apparatus wherein the network

comprises a Transmission Control Protocol/Internet Protocol (TCP/IP) network. See col.

13, lines 7-13, wherein the TCP/IP is an inherent feature of the ESCON system.

As per claim 14, Yanai et al. discloses an apparatus wherein the memory comprises a nonvolatile random access memory (NVRAM). See col. 18, lines 5-9, *wherein random access memory is backed-up by a battery power which makes the RAM becomes a nonvolatile random access memory.*

As per claim 15, Yanai et al. discloses an apparatus wherein the destination storage server modifies an image of a volume maintained by the source storage server on a second nonvolatile mass storage device (secondary volumes) coupled to the destination storage server according to the access request (col. 10, lines 50-58) when the source storage server makes a synchronization request (col. 10, lines 19-23).

As per claim 16, Yanai et al. discloses an apparatus wherein the data container is a file. See Fig. 12, item 294, wherein R2 comprises of data file.

3.   Claims 17, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al. (6,502,205) in view of McMillian, Jr. and Achiwa et a. (US 20040153719).

As per claim 17, Yanai et al. discloses a method comprising:

receiving a data access request at a destination filer from source filer, wherein the data access request is written to a first memory coupled to the source filer (col. 9, lines 59-64, wherein the data is copied to the second storage system from the primary

storage system and the data is externally influenced by a host coupled to the primary

storage system);

sending an acknowledgement to the source filer in response to the destination

filer receiving the data access request (col. 10, lines 19-24);

writing the data access request to a second memory (Fig. 12, item 293) coupled

to the destination filer (col. 32, lines 49-57);

transferring the data access request from the second memory 293 to a file

corresponding to a source filer on a volume coupled to the destination filer (col. 32, lines

37-38; lines 49-53);

receiving a second data access request from a second source filer (col. 2, lines

54-59), wherein the second data access request is written to a third memory coupled to

the second source filer (col. 32, lines 55-56);

sending a second acknowledgement to the second source filer in response to the

destination filer receiving the second data access request (col. 10, lines 19-24);

writing the second data access request to the second memory (Fig. 12, item 293,

col. 32, lines 49-57);

transferring the second data access request to a second file corresponding to the

second source filer on the volume coupled to the destination filer (col. 32, lines 37-38;

lines 49-53);

Yanai et al. did not explicitly disclose a method of removing the data access

request from the second memory after transferring the data access request to the

volume. However, McMillan disclosed a method of removing a request when an

acknowledgement is transferred from one location to another (col. 5, lines 35-39). At

the time of the Applicant's invention it would have been obvious to one having an

ordinary skill in the art to recognize that it is advantageous to remove/delete the access

request once the transaction is completed or the data has been transferred. The

motivation of doing so is to prevent unnecessary data from transferring to the volume

again and maintaining an appropriate operation of the system while increasing data

throughput.

Although Yanai et al. did not explicitly disclose a second source filer coupled to

the destination filer which performing the duplicate tasks as of the first source filer.

However, Achiwa et al. discloses a system wherein there are multiple storage servers

interconnected with each other in order to replicate the copy of data stored in the

storage device. See Fig. 1 and page 1, paragraph 0009, lines 1-12.

It would have been obvious to one having an ordinary skill in the art at the time of

the Applicant's invention to combine the system of Achiwa et al. with the system of

Yanai et al. in order to arrive at the current invention. The motivation of doing so is

provide a data storage system with a backup source filer in case one of the source filer

failed as taught by Achiwa et al. on page 1, paragraph 0006, lines 4-7.

As per claim 19, Yanai et al. did not explicitly disclose a method of connecting a

second source filer to the client in response to a system failure.

However, Achiwa et al. discloses a method further comprising connecting the

second source filer to the client in response to a system failure. See page 1, paragraph

0006, lines 4-7.

It would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to connect the source filer to the client in response to the system failure. The motivation of doing so is to provide a stable storage system since there are additional sources to take over the operation process if one of the other sources failed.

As per claim 20, Yanai et al. disclosed a method comprising:

applying the access request to an image of a volume maintained by the source filer and allowing the client to access the image. See col. 17, lines 25-40.

Response to Arguments

4.   Applicant's arguments filed August 28, 2006 have been fully considered but they are not persuasive.

With respect to claims 1 and 10, Applicant argued that the cited prior arts fail to disclose the limitation:

"when the first portion of the non-volatile storage device in the first storage server is full, causing the second storage server to transfer the data access request from the mass storage device on the second storage server to a data container corresponding to the first storage server on the second storage server".

Examiner respectfully disagree with the reason Applicant presented on page 9 with respect to claim 1 in the Remarks. As previously stated in the U.S.C 103(a) Rejection above, although Yanai et al. discloses all of the limitation of claims 1 and 10 except the method of transferring the data from the first storage server to the second storage server if the storage in the first storage server is full. Courts et al. fulfill the

deficiency of Yanai et al. by disclosing a method of transferring the data from the first memory location to the second memory location if the first memory location is full. In addition to the motivation stated above, claims 1 and 10 are unpatentable over Yanai et al. in view of Courts et al.

With respect to claims 17, Examiner cited additional disclosure of Yanai et al. to further enforce the previous rejection.

Conclusion

5.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh D. Vo whose telephone number is (571) 272-0708. The examiner can normally be reached on M-F 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald G. Bragdon can be reached on (571) 272-4204. The fax phone
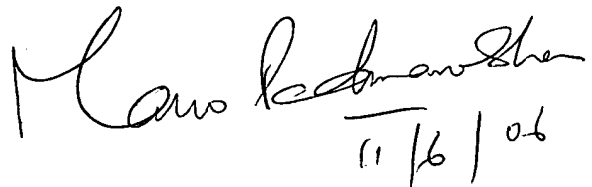
number for the organization where this application or proceeding is assigned is 571-
273-8300.

Information regarding the status of an application may be obtained from the

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thanh D. Vo
Examiner
Art Unit 2189
11/3/2006

MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER